

REMARKS

By the present amendment, claim 6 has been amended to recite that the backlight comprises a reflection polarizing film. Support for this recitation is found in the original application, for example in paragraph [0029]. Further, claim 7 has been rewritten to recite claim 7 has now been amended to recite that, when polarized light is incident on at least one surface of said semi-transmissible reflector type polarizer, the light transmitted through the semi-transmissible reflector type polarizer is reduced by at most 10%, as compared to the incident polarized light, and claim 8 has been amended accordingly.

It is submitted that the amendments are language reformulations and do not raise new issues. Accordingly, entry and consideration of the amendments is respectfully requested.

As a preliminary, Applicants and Applicants' representative thank the Examiner for the personal interview which was held on July 28, 2004.

Claims 1-12 are pending in the present application. Independent claim 1, and claims 2-4 and 7-12 dependent directly or indirectly thereon, are directed to a semi-transmissible reflector. Claim 5, and claim 6 dependent thereon, are directed to a liquid-crystal display device and are dependent on claims 3 or 4.

In the Office Action, claims 6-9 are rejected under 35 U.S.C. 112, second paragraph, as indefinite. It is alleged in the Office Action that it does not make sense to use a reflective polarizer as a backlight because a polarizer does not emit light, and that the expression "reduction in light" is unclear, and that the transmitted light from the backlight is at most 50% since the semi-transmissible reflector-type polarizer includes a polarizer.

Reconsideration and withdrawal of the rejection is respectfully requested. Applicants

submit that claim 6 was previously amended to replace “a reflection polarizing film is used as the backlight” by “a reflection polarizing film used in the backlight”. For further clarity, the above expression has now been replaced by “the backlight comprises a reflection polarizing film”.

Further, claim 7 has now been rephrased to recite that “when polarized light is incident on at least one surface of said semi-transmissible reflector type polarizer, the light transmitted through the semi-transmissible reflector type polarizer is reduced by at most 10%, as compared to the incident polarized light”. It is submitted that the recitation in present claim 7 is a simple rephrasing of the previous formulation and is immediately understood by a person of ordinary skill in the art, since a purpose of the semi-transmissible reflector type polarizer is to be used with a backlight having polarizing characteristic, so that it is advantageous to avoid a large reduction of transmittance of the light emitted by the backlight, as discussed in particular in paragraph [0005] of the present specification.

In view of the above, it is submitted that the rejection should be withdrawn.

Next, in the Office Action, claims 1-3 and 5-9 are rejected under 35 U.S.C. 103(a) as obvious over US 4,093,356 to Bigelow (Bigelow) in view of US 4,266,859 to Togashi (Togashi) [the Office Action states “Togashi 4586790” but it has been clarified with the Examiner following the interview that the patent referred to was Togashi 4,266,859], US 3,912,369 to Kashnow (Kashnow) and US 4,533,214 to Penz et al. (Penz). It is alleged in the Office Action that Togashi as well as Kashnow disclose a reflector made by depositing metal on a waveplate, so that it would have been obvious to make the semi-reflector of Bigelow by depositing metal on the waveplate, and that Penz also favors uniaxially drawn polymer substrates as light, strong, and stable for metal deposition.

The rejection is again respectfully traversed. As discussed in the response to the previous Office Action and during the personal interview, it is submitted that the fully reflective metal layers of Kashnow and Togashi are not predictive of whether a partially transmissive metal layer could be successfully provided on a waveplate.

Specifically, the assertion in the Office Action that a partial reflector is “the same thing” (Office Action at page 3, seven lines from bottom) as the reflector as in Kashnow and Togashi is respectfully but forcefully traversed. A person of the art would immediately recognize that the only optical property that is required from the totally reflecting metal layer of Kashnow and Togashi is that the surface of the metal layer oriented toward the incident light be formed so as to reflect all incident light. Any transmissive properties of the metal layer are detrimental in a reflector. Thus, for example, some irregularities in the metal layer of Kashnow and Togashi may be acceptable as long as the surface of the metal layer consistently reflects incident light.

In contrast, in the case of a partially transmissive metal layer, a dual optical property is required, i.e., (i) reflection of a portion of incident light, and (ii) transmission of another portion of incident light. Thus, even if, arguendo, a person of ordinary skill in the art might have hoped that the optical property of a partially transmissive metal layer applied on the substrate of Kashnow and Togashi would be analogous to the optical property of a totally reflecting metal layer, that expectation would have concerned only the portion (i) of incident light that is reflected by the partially transmissive metal layer. Regarding the portion (ii) of incident light that is transmitted by the partially transmissive metal layer, that person could not have found in Kashnow or Togashi provide any indication, motivation or expectation that a semi-transmissive metal layer, when applied on the quarterwave plate, might also provide adequate transmissive property.

In addition, the issue of the motivation to combine must be considered in the context of the construction taught by Bigelow. Namely, Bigelow teaches generally that the base may be an “optically transparent material, such as glass and the like” (Bigelow at col. 2, line 52), but in all embodiments of Bigelow, a glass plate is provided for each partially transmissive metal layer, even though the semi-transmissive optical element is to be sandwiched between two quarterwave plates. As a result, a person of ordinary skill in the art would clearly read Bigelow as excluding a quarterwave plate as a substrate for application of a semi-transmissive metal layer. In other words, Bigelow teaches that a quarterwave plate is not the type of substrate that may be used “like” glass to form a semi-transmissive optical element.

In summary, a person of ordinary skill in the art would have found a clear indication in Bigelow that the substrate on which to apply a partially transmitting metal layer should be “glass or the like”, i.e., not a quarterwave plate. Turning to Kashnow and Togashi, that person would have found only a teaching that a fully reflecting metal layer may be applied to a quarterwave plate, but that person would have found no indication in Kashnow and Togashi as to whether applying a partially transmitting metal layer onto a quarterwave plate (against the teaching of Bigelow), would result in an optical element with acceptable optical properties, not only for the reflected portion of light, but also for the transmitted portion of light. Therefore, the person of ordinary skill in the art would have abided by the teaching of Bigelow and provided a glass plate or another “like” substrate acceptable by Bigelow on which to apply the semi-transmissive metal layer.

In contrast, the present inventors have discovered that a light-transmissible substrate uniaxially drawn to have uniaxial orientation characteristic may nevertheless be used as a substrate on which to form directly a semi-transmissible reflection layer, as recited in present claim 1, and

further, that the optical properties of the resulting semi-transmissible reflector are advantageous in that coloring in a display may be reduced or eliminated, as shown by the Examples and comparative Examples in the present specification. This feature of the presently claimed invention could not have been derived from Bigelow and Kashnow and/or Togashi, except in hindsight, because Bigelow teaches that a quarterwave plate is not appropriate for applying a semi-transmissive metal layer, and Kashnow and Togashi, which are limited to fully reflective metal layers, do not provide any suggestion that Bigelow could be modified. Further, Penz is completely silent as to both (i) the deposition of a metal layer and (ii) a semi-transmissible layer, so that Penz fails to remedy the deficiencies of Bigelow and Kashnow. Therefore, the present claims are not obvious over Bigelow, Kashnow, Togashi, and/or Penz taken alone or in any combination.

In view of the above, it is submitted that the rejection should be withdrawn.

In conclusion, the invention as presently claimed is patentable. It is believed that the claims are in allowable condition and a notice to that effect is earnestly requested.

In the event there is, in the Examiner's opinion, any outstanding issue and such issue may be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Serial Number: 10/067,292

Group Art Unit: 2871

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of the response period. Please charge the fee for such extension and any other fees which may be required to our Deposit Account No. 50-2866.

Respectfully submitted,

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